PLANT PHYSIOLOGY

EDITORS

WALTER F. LOEHWING

C. H. WADLEIGH
M. W. PARKER
J. B. BIALE
IRENE H. STUCKEY
H. B. VICKERY
F. P. CULLINAN
C. S. FRENCH
F. G. GUSTAFSON

ROBERT M. MUIR

H. A. BORTHWICK
P. J. KRAMER
E. J. KRAUS
K. C. HAMMER
R. EMERSON
J. P. BENNETT

VOLUME 27

1952

THE SCIENCE PRESS
LANCASTER, PENNSYLVANIA

TABLE OF CONTENTS

NUMBER 1. JANUARY

The amino acid composition and distribution of N^{15} in soybean root nodules supplied N^{15}-enriched N_2.
I. ZELITCH, P. W. WILSON and R. H. BURRIS 1– 8
The behavior of isocitric acid in excised leaves of *Bryophyllum calycinum* during culture in alternating light and darkness.
HUBERT BRADFORD VICKERY 9– 17
Investigation on injury to plants from air pollution in the Los Angeles area.
A. J. HAAGEN-SMIT, ELLIS F. DARLEY, MILTON ZAITLIN, HERBERT HULL and WILFRED NOBLE 18– 34
The action spectrum for the photochemical evolution of oxygen by isolated chloroplasts ..... S. L. CHEN 35– 48
Relationships of certain nutrients, metabolites, and inhibitors to growth in the Avena coleoptile ..... BRUCE J. COOIL 49– 69
An improved electrical conductivity method for accurately following changes in the respiratory quotient of a single biological sample.
JAMES M. WOLF, ALLAN H. BROWN and DAVID R. GODDARD 70– 80
Influence of storage temperature on carotene, total carotenoids and ascorbic acid content of sweetpotatoes.
BOYCE D. EZELL and MARGUERITE S. WILCOX 81– 94
Some factors affecting nectar secretion in red clover .. R. W. SHUEL 95–110
Studies in plant carbonic anhydrase. II. Kinetic studies.
R. U. BYERRUM and E. H. LUCAS 111–120
Physiological and morphological responses of barley to 2,4-dichlorophenoxyacetic acid ..... LYLE A. DERSCHEID 121–134
The effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes.
D. R. PATERSON, S. H. WITTWER, L. E. WELLER and H. M. SELL 135–142
The absorption and translocation of 2,4-dichlorophenoxyacetic acid by bean plants ..... BOYSIE E. DAY 143–152
Brittleness and other responses of corn to 2,4-dichlorophenoxyacetic acid ..... EARL G. RODGERS 153–172
Nitrogen and amino acids in normal, habituated, and bacteria-free crown gall tumor tissue cultures of grape .... ADDISON E. LEE 173–178
Stimulation of seedling growth by seed treatments with N-phenyl succinimide derivatives .. SEWARD E. ALLEN and FOLKE SKOOG 179–183
Percentage of carbohydrates in kernels of Station Reid Yellow Dent corn at several stages of development .... E. B. EARLEY 184–190
Ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate.
WILLIAM C. COOPER, B. S. GORTON and E. O. OLSON 191–203

Iron-containing frit as a nutriculture medium.
W. H. Klein and G. F. Warren 204–205
The influence of the green mesophyll in stomatal movement.
Paulo de T. Alvim 206–209
Albinism induced by substituted benzoic acids.
D. Ready, C. E. Minarik, D. Bradbury, H. E. Thompson and J. F. Owings, Jr. 210–211
The Hill reaction: Development of chloroplast activity during greening of etiolated barley leaves.
James H. C. Smith, C. S. French and Violet M. Koski 212–213
Notes 214–222

Number 2. April

Molybdenum requirement of leguminous plants supplied with fixed nitrogen ... W. R. Meagher, C. M. Johnson and P. R. Stout 223–230
The formation of starch in leaves of *Bryophyllum calycinum* cultured in darkness ..... Hubert Bradford Vickery 231–239
Metabolism of infiltrated organic acids by tobacco leaves.
V. Zbinovsky and R. H. Burris 240–250
Electrical and curvature responses of the Avena coleoptile to unilateral illumination ..... G. E. Backus and A. R. Schrank 251–262
Genetic and chlorophyll studies of a yellow-green mutant in muskmelon ..... Thomas W. Whitaker 263–268
Effect of petroleum oil spray on photosynthesis and respiration in citrus leaves .. R. T. Wedding, L. A. Riehl and W. A. Rhoads 269–278
The osmotic change during auxin-induced water uptake by potato tissue ..... David P. Hackett 279–284
Surface activity as related to physiological activity of plant growth-regulators ..... Leslie G. Paleg and Robert M. Muir 285–292
Metabolism of 2,4-dichlorophenoxyacetic acid. I. $C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids.
Robert L. Weintraub, James W. Brown, Melvin Fields and John Rohan 293–301
Frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of isoleucine and leucine and with *Bacillus cereus* toxin ..... Robert A. Steinberg 302–308
Varietal root and top regeneration of fig cuttings as influenced by the application of indolebutyric acid.
Julian C. Crane and Tara S. Mallah 309–319
Measurement of metabolic gas exchange with a recording mass spectrometer. Allan H. Brown, Alfred O. C. Nier and Richard W. Van Norman 320–334
Nitrogen and phosphorus fractions, respiration, and structure of normal and crown gall tissues of tomato .. Richard M. Klein 335–354

Pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of sweetpotatoes.
BOYCE D. EZELL, MARGUERITE S. WILCOX and JOHN N. CROWDER 355–369
Absorption spectra of leaves. I. The visible spectrum.
R. A. Moss and W. E. LOOMIS 370–391
The role of ortho-substitution in the synthetic auxins.
KENNETH V. THIMANN 392–404
Further studies in the simplification of equipment for subirrigation experiments in plant nutrition ..... GEORGE R. JOHNSTONE 405–407
Relationship of the cobalt and light effects on expansion of etiolated bean leaf disks ..... CARLOS O. MILLER 408–413
Light absorption by chlorophyll at high concentrations.
S. ARONOFF 413–416
The effect of hypocotyl temperature on translocation of carbohydrates from bean leaves.
R. H. BÖHNING, C. A. SWANSON and A. J. LINCK 417–421
The biosynthesis of carbon-14-labeled compounds. II. The chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from plant extracts.
G. R. NOGGLE and M. ELEANOR SCHUMACHER 422–426
Notes 427–430

NUMBER 3. JULY

The uptake of phosphorus by bean plants with particular reference to the effects of iron .... O. BIDDULPH and C. G. WOODBRIDGE 431–444
The mechanism of the tetrazolium reaction in corn embryos.
FREDERICK G. SMITH 445–456
A kinetic study of the absorption of alkali cations by barley roots.
EMANUEL EPSTEIN and C. E. HAGEN 457–474
A comparative study of gradual and abrupt changes in root temperature on water absorption.
R. H. BÖHNING and BHAKDI LUSANANDANA 475–488
The permeability of non-stomate leaf epidermis to carbon dioxide.
W. M. DUGGER 489–499
The measurement of oxidation-reduction potentials of cottonseed slurries .. M. Z. CONDON, F. R. ANDREWS and A. M. ALTSCHUL 500–506
The relation of acids and peroxides in spray oils to the respiration of sprayed bean leaves and the development of injury.
C. M. JOHNSON and W. M. HOSKINS 507–525
Inhibition of growth by benzene hexachloride isomers and protective effect of glucose as measured by cell counting technique.
H. T. HOPKINS 526–540
Fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and fruitfulness.
FRANK M. EATON and DAVID R. ERGLE 541–562

A critical study of the cobalt chloride method of measuring transpiration .. L. F. Bailey, J. S. Rothacher and W. H. Cummings 563–574
The effect of light and nitrogen levels on growth and alkaloid content of young plants of *Cinchona ledgeriana*.
Harold F. Winters and Arnaud J. Loustalot 575–582
The effect of calcium on the absorption of potassium by barley roots.
Roy Overstreet, Louis Jacobson and Raymond Handley 583–590
Effects of light on elongation and branching in pea roots.
John G. Torrey 591–602
Absorption and translocation of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by green plants.
Avery H. Gallup and Felix G. Gustafson 603–612
Catalase-chlorophyll relationship in barley seedlings.
David Appleman 613–621
Growth regulating properties of some thiosemicarbazones.
Robertson Pratt, Jean Dufrenoy and Peter P. T. Sah 622–625
Increasing the size of Thompson seedless grapes by means of 4-chlorophenoxyacetic acid, berry thinning and girdling.
Robert J. Weaver and A. J. Winkler 626–630
The effect of intermittently varied petiole temperature on carbohydrate translocation from bean leaves.
William A. Kendall 631–633
Temperature response of fungi as a straight line transformation.
Morris Cohen and C. E. Yarwood 634–638
Effect of 2,4-dichlorophenoxyacetic acid on proteolytic activity of red kidney bean plants.
Theodore L. Rebstock, Charles L. Hamner, Charles D. Ball and Harold M. Sell 639–643
Photoperiodic response of Lespedeza ..... Shigeru Nakata 644–647
Notes 648–650

Number 4. October

Enzymatic activities as indications of copper and iron deficiencies in plants ..... J. C. Brown and S. B. Hendricks 651–660
Longitudinal gradients of P^{32} absorption in roots.
Paul J. Kramer and Herman H. Wiebe 661–674
The distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione.
David G. Anderson, Helen A. Stafford, Eric E. Conn and Birgit Vennesland 675–684
Effect of age of leaves upon the rate of photosynthesis in some conifers ..... R. O. Freeland 685–690
The relative rates of photosynthetic assimilation of isotopic forms of carbon dioxide ..... R. W. Van Norman and A. H. Brown 691–709
Temperature of potato and tomato leaves.
Paul E. Waggoner and R. H. Shaw 710–724

Malonic acid as an inhibitor of maize root respiration.
H. Beevers 725–735
Ascorbic acid formation in potato tuber slices.
Frederick G. Smith 736–744
Premature blossoming: Effects of vernalization, seedling age and environment on subsequent growth and flowering of transplanted tobacco ..... Robert A. Steinberg 745–753
Compositional and physiological changes associated with the chemical defoliation of cotton.
Wayne C. Hall and Harry C. Lane 754–768
Some relationships between xerophytism and the content of resin, nordihydroguaiaretic acid and protein of *Larrea divaricata* Cav. ..... Peter C. Duisberg 769–777
Physiological changes and freezing injury in maturing maize.
M. M. Aboul-Ela 778–786
A relationship between photoperiodism and respiration.
B. B. Elliott and A. C. Leopold 787–793
Some effects of artificial drying of corn grain.
H. W. Gausman, J. H. Ramser, G. H. Dungan, F. R. Earle, M. M. MacMasters, H. H. Hall and P. D. Baird 794–802
Effect of 2,4-dichlorophenoxyacetic acid on meristematic tissues of corn ..... David W. Staniforth 803–811
Some effects of zinc on several species of Gossypium L.
Lamar C. Brown and Charles C. Wilson 812–817
The effect of different tissue pretreatments on the physico-chemical properties of expressed plant sap ..... G. K. Voigt 818–821
The use of chromotropic acid for the quantitative determination of 2,4-dichlorophenoxyacetic acid.
Duane LeTourneau and Norman Krog 822–827
Extracellular photosynthetic reactions. II. Identification of radioactive malate ... Daniel I. Arnon and Gunilla Heimbürger 828–833
Diortho substituted phenoxyacetic acids as antiauxins.
D. Harold McRae and James Bonner 834–838
Notes 839–844
General Index, Volume 27 845–860

ERRATA

Volume **26**:

Page **521**, line 3, liberation of organic phosphate should read liberation of inorganic phosphate.

Page **598**, line 29, component may be expressed should read component (solvent or constituent solute) may be expressed.

Page **598**, line 30, molal free energy difference per liter of component flux should read molal free energy difference divided by the partial molal volume (at its reference state) of the constituent component subject to flux consideration.

Page **599**, lines 23 and 24, $\bar{v}_2$ in liters should read $\bar{v}_2$ in liters per mole.

Page **599**, lines 27 and 28, $\bar{v}_2$ is the partial molal volume of the constituent solute in solution, in liters should read $\bar{v}_2^\circ$ is the partial molal volume of the constituent solute in solution, in liters per mole.

Pages **599** to **608**, factor $\bar{v}$ should read $\bar{v}^\circ$.

Page **600**, line 9, delete of solute flux.

Page **603**, line 16, equation (27) should read $\mathrm{REE} = \frac{m}{L^2t} \times \frac{m}{Lt^2} \times \frac{L^2}{1} \times \frac{L^3}{m} = \frac{mL^2}{t^2} \times \frac{1}{t}$.

Page **603**, line 18, The ratio $\bar{v}/m$ should read The factor $A \times \bar{v}^\circ/m$.

Page **603**, line 19, delete of solute flux.

Page **603**, line 20, RNI is in grams should read RNI is in grams per square centimeter per second.

Pages **655** to **672**, factor $\bar{v}$ should read $\bar{v}^\circ$.

Page **657**, line 45, delete In other words, flux intensities are not forces per unit area, but rather are forces concerned with the ordered movement of a unit volume of a constituent component of solution through a unit of distance.

Pages **699**, **701**, **703**, **705**, and **707**, title, Acetaldehyde should read Aldehydes.

Page **787**, line 37, in the 5/P and 2/P groups should read in the 5P and 2P groups.

Volume **27**:

Page **104**, lines 38 and 42, and Page **105**, lines 3 and 4, Method 1 should read Method a and Method 2 should read Method b to correspond with designations in figure 3.

Page **109**, line 12, affect should read effect.

Page **140**, paragraph 2, line 5, non-reducing sugars in non-treated lots should read non-reducing sugars as was in non-treated lots.

Page **463**, line 23, K, the constant, should read K, the constants.

Page **463**, line 25, V^1 should read V^1.

Page **466**, legend for figure 5, interference of Na and Rb uptake should read interference of Na with Rb uptake.

Page **469**, Table I, Figure 5 should read Figure 3.

Page **469**, Table I, Figure 6 (left) should read Figure 4 (left).

Page **469**, Table I, Figure 11 should read Figure 8.

Page **470**, line 10, which the un-competitively affected should read which are uncompetitively affected.

Page **471**, Table II, Figure 6 (right) should read Figure 4 (right).

Page **471**, Table II, Figure 7 should read Figure 5.

Page **530**, line 5, although specifically should read although not specifically.

Page **530**, line 15, adenosine triphosphate should read adenosinephosphatase.

GENERAL INDEX

A

Aboul-Ela, M. M., Physiological changes and freezing injury in maturing maize, 778

Absorption and translocation of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by green plants, 603

and translocation of 2,4-dichlorophenoxyacetic acid by bean plants, the, 143

light, by chlorophyll at high concentrations, 413

of alkali cations by barley roots, a kinetic study of the, 457

of potassium by barley roots, the effect of calcium on the, 583

P^{32}, longitudinal gradients of, in roots, 661

spectra of leaves. I. The visible spectrum, 370

water, a comparative study of gradual and abrupt changes in root temperature on, 475

Accumulation, ionic, in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, 191

Acids and peroxides in spray oils, the relation of, to the respiration of sprayed bean leaves and the development of injury, 507

Action spectrum for the photochemical evolution of oxygen by isolated chloroplasts, the, 35

of Hormones in Plants and Invertebrates, The, K. V. Thimann, Editor, 842

Addoms, Ruth M., Obituary, 219

Advances in Agronomy, Volume III, A. G. Norman, Editor, 429

in Enzymology and Related Subjects of Biochemistry, Volume XII, F. F. Nord, Editor, 429

in Enzymology and Related Subjects of Biochemistry, Volume XIII, F. F. Nord, Editor, 841

Air pollution in the Los Angeles area, investigation on injury to plants from, 18

Albinism induced by substituted benzoic acids, 210

Alkali cations, a kinetic study of the absorption of, by barley roots, 457

Alkaloid content of young plants of *Cinchona ledgeriana*, the effect of light and nitrogen levels on growth and, 575

Allen, Seward E., Stimulation of seedling growth by seed treatments with N-phenyl succinimide derivatives, 179

Altschul, A. M., The measurement of oxidation-reduction potentials of cottonseed slurries, 500

Alvim, Paulo De T., The influence of the green mesophyll in stomatal movement, 206

American Society of Plant Physiologists, Annual Meeting, 1951, 215

Society of Plant Physiologists, Annual Report of the Executive Secretary-Treasurer of the, for 1950–1951, 216

Society of Plant Physiologists, Annual Report of the Executive Secretary-Treasurer of the, for 1951–1952, 844

Society of Plant Physiologists Election, 1952–1953, 839

Amino acid composition and distribution of N^{15} in soybean root nodules supplied N^{15}-enriched N_2, the, 1

acids in normal, habituated, and bacteria-free crown gall tumor tissue cultures of grape, nitrogen and, 173

Anderson, David G., The distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capaple of reducing glutathione, 675

Andrews, F. R., The measurement of oxidation-reduction potentials of cottonseed slurries, 500

Antiauxins, diortho substituted phenoxyacetic acids as, 834

Annual Review of Plant Physiology, Volume II, D. I. Arnon, Editor, 217

Review of Plant Physiology, Volume III, D. I. Arnon, Editor, 841

Appleman, David, Catalase-chlorophyll relationship in barley seedlings, 613

Arnon, D. I., Editor, Annual Review of Plant Physiology, Volume II, 217

Annual Review of Plant Physiology, Volume III, 841
Extracellular photosynthetic reactions, II. Identification of radio-active malate, 828
Aronoff, S., Light absorption by chlorophyll at high concentrations, 413
Ascorbic acid content of sweetpotatoes, influence of storage temperature on carotene, total carotenoids and, 81
acid content of sweetpotatoes, pre- and post-harvest changes in carotene, total carotenoids and, 355
acid formation in potato tuber slices, 736
Assimilation, photosynthetic, of isotopic forms of carbon dioxide, the relative rates of, 691
Auchter, Eugene Curtis, Obituary, v
Portrait, iii
Auxin-induced water uptake by potato tissue, the osmotic change during, 279
Auxins, synthetic, the role of ortho-substitution in the, 392
Avena coleoptile, electrical and curvature responses of the, to unilateral illumination, 251
coleoptile, relationships of certain nutrients, metabolites, and inhibitors to growth in the, 49

B

Bacillus cereus toxin, frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of isoleucine and leucine and with, 302
Backus, G. E., Electrical and curvature responses of the Avena coleoptile to unilateral illumination, 251
Bacterial Physiology, C. H. Werkman and P. W. Wilson, Editors, 428
Bailey, Alton E., Industrial Oil and Fat Products, 429
Bailey, L. F., A critical study of the cobalt chloride method of measuring transpiration, 563
Baird, P. D., Some effects of artificial drying of corn grain, 794
Ball, Charles D., Effect of 2,4-dichlorophenoxyacetic acid on proteolytic activity of red kidney bean plants, 639
Barley leaves, etiolated, development of chloroplast activity during greening of, the Hill reaction:, 212
roots, a kinetic study of the absorption of alkali cations by, 457
roots, the effect of calcium on the absorption of potassium by, 583
seedlings, catalase-chlorophyll relationship in, 613
Barnett, H. L., Physiology of the Fungi, 217
Barron, E. S. G., Modern Trends in Physiology and Biochemistry, 648
Bean leaf disks, etiolated, relationship of the cobalt and light effects of expansion of, 408
leaves, sprayed, the relation of acids and peroxides in spray oils to the respiration of, and the development of injury, 507
leaves, the effect of hypocotyl temperature on translocation of carbohydrates from, 417
leaves, the effect of intermittently varied petiole temperature on carbohydrate translocation from, 631
plants, the uptake of phosphorus by, with particular reference to the effects of iron, 431
plants treated with labeled 2,4-dichlorophenoxyacetic acids, I. $C^{14}O_2$ production by, Metabolism of 2,4-dichlorophenoxyacetic acid, 293
Beevers, H., Malonic acid as an inhibitor of maize root respiration, 725
Behavior of isocitric acid in excised leaves of *Bryophyllum calycinum* during culture in alternating light and darkness, the, 9
Benzene hexachloride isomers, inhibition of growth by, and protective effect of glucose as measured by cell counting technique, 526
Benzoic acids, substituted, albinism induced by, 210
Berry thinning, 4-chlorophenoxyacetic acid, and girdling, increasing the size of Thompson seedless grapes by means of, 626
Biddulph, O., The uptake of phosphorus by bean plants with particular reference to the effects of iron, 431
Biosynthesis of carbon-14-labeled compounds, the, II. The chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from plant extracts, 422

Blossoming, premature: Effects of vernalization, seedling age and environment on subsequent growth and flowering of transplanted tobacco, 745

Böhning, R. H., A comparative study of gradual and abrupt changes in root temperature on water absorption, 475

The effect of hypocotyl temperature on translocation of carbohydrates from bean leaves, 417

Bonner, James, Diortho substituted phenoxyacetic acids as antiauxins, 834

Principles of Plant Physiology, 430

Boron in the substrate, ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and, 191

Botany of Sugarcane, by C. van Dillewijn, 843

Bradbury, D., Albinism induced by substituted benzoic acids, 210

Brittleness and other responses of corn in 2,4-dichlorophenoxyacetic acid, 153

Brown, Allan H., An improved electrical conductivity method for accurately following changes in the respiratory quotient of a single biological sample, 70

Measurement of metabolic gas exchange with a recording mass spectrometer, 320

The relative rates of photosynthetic assimilation of isotopic forms of carbon dioxide, 691

Brown, James W., Metabolism of 2,4-dichlorophenoxyacetic acid. I. $C^{14}O_2$ production by bean plants treated with 2,4-dichlorophenoxyacetic acids, 293

Brown, J. C., Enzymatic activities as indications of copper and iron deficiencies in plants, 651

Brown, Lamar C., Some effects of zinc on several species of Gossypium L., 812

Bryophyllum calycinum cultured in darkness, the formation of starch in leaves of, 231

calycinum, the behavior of isocitric acid in excised leaves of, during culture in alternating light and darkness, 9

Burris, R. H., Metabolism of infiltrated organic acids by tobacco leaves, 240

The amino acid composition and distribution of N^{15} in soybean root nodules supplied N^{15}-enriched N_2, 1

Byerrum, R. U., Studies in plant carbonic anhydrase, II. Kinetic studies, 111

C

Calcium, the effect of, on the absorption of potassium by barley roots, 583

Caldwell, Joseph, S., Obituary, 648

Carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and fruitfulness, fiber properties and, 541

translocation from bean leaves, the effect of intermittently varied petiole temperature on, 631

Carbohydrates from bean leaves, the effect of hypocotyl temperature on translocation of, 417

in kernels of Station Reid Yellow Dent corn at several stages of development, percentages of, 184

Carbon dioxide, the relative rates of photosynthetic assimilation of isotopic forms of, 691

dioxide, the permeability of non-stomate leaf epidermis to, 489

-14-labeled compounds, the biosynthesis of, II. The chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from plant extracts, 422

$C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids, I., Metabolism of 2,4-dichlorophenoxyacetic acid, 293

Carbonic anhydrase, plant, studies in, 111

Carotene, total carotenoids and ascorbic acid content of sweetpotatoes, pre- and post-harvest changes in, 355

Catalase-chlorophyll relationship in barley seedlings, 613

Cations, alkali, a kinetic study of the absorption of, by barley roots, 457

Chandler, William H., Charles Reid Barnes Honorary Life Member, 214

Charles Reid Barnes Honorary Life Member, William H. Chandler, 214

Chemistry and Technology of Food and Food Products, Volumes I and II, The, Morris B. Jacobs, Editor, 219

and Technology of Food and Food Products, Volume III, The, Morris B. Jacobs, Editor, 649

Chen, S. L., The action spectrum for the photochemical evolution of oxygen by isolated chloroplasts, 35

Chlorophyll at high concentrations, light absorption by, 413
studies of a yellow-green mutant in muskmelon, genetic and, 263
Chloroplast activity during greening of etiolated barley leaves, development of, the Hill reaction:, 212
Chloroplasts, isolated, the action spectrum for the photochemical evolution of oxygen by, 35
Chromotropic acid, the use of, for the quantitative determination of 2,4-dichlorophenoxyacetic acid, 822
Cinchona ledgeriana, the effect of light and nitrogen levels on growth and alkaloid content of young plants of, 575
Citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, ionic accumulation in, 191
leaves, effect of petroleum oil spray on photosynthesis and respiration in, 269
Clover, red, some factors affecting nectar secretion in, 95
Cobalt and light effects on expansion of etiolated bean leaf disks, relationship of the, 408
chloride method of measuring transpiration, a critical study of the, 563
COHEN, MORRIS, Temperature response of fungi as a straight line transformation, 634
Coleoptile, Avena, relationships of certain nutrients, metabolites, and inhibitors to growth in the, 49
Comparative study of gradual and abrupt changes in root temperature on water absorption, a, 475
Compositional and physiological changes associated with the chemical defoliation of cotton, 754
CONDON, M. Z., The measurement of oxidation-reduction potentials of cottonseed slurries, 500
Conductivity method, an improved electrical, for accurately following changes in the respiratory quotient of a single biological sample, 70
Conference on the Use of Isotopes, 430
Conifers, some effect of age of leaves upon the rate of photosynthesis in, 685
CONN, ERIC E., The distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione, 675
COOIL, BRUCE J., Relationships of certain nutrients, metabolites, and inhibitors to growth in the Avena coleoptile, 49
COOPER, WILLIAM C., Ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, 191
Copper and iron deficiencies in plants, enzymatic activities as indications of, 651
Corn, brittleness and other responses of, to 2,4-dichlorophenoxyacetic acid, 153
effect of 2,4-dichlorophenoxyacetic acid on meristematic tissues of, 803
embryos, the mechanism of the tetrazolium reaction in, 445
grain, some effects of artificial drying of, 794
Station Reid Yellow Dent, percentage of carbohydrates in kernels of, at several stages of development, 184
Cotton, compositional and physiological changes associated with the chemical defoliation of, 754
plants, fiber properties and carbohydrate and nitrogen levels of, as influenced by moisture supply and fruitfulness, 541
Cottonseed slurries, the measurement of oxidation-reduction potentials of, 500
CRANE, JULIAN C., Varietal root and top regeneration of fig cuttings as influenced by the application of indolebutyric acid, 309
Critical study of the cobalt chloride method of measuring transpiration, a, 563
CROWDER, JOHN N., Pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of sweetpotatoes, 355
CUMMINGS, W. H., A critical study of the cobalt chloride method of measuring transpiration, 563

D

DARLEY, ELLIS F., Investigation on injury to plants from air pollution in the Los Angeles area, 18
DAY, BOYSIE E., The absorption and translocation of 2,4-dichlorophenoxyacetic acid by bean plants, 143

Deficiencies, copper and iron, enzymatic activities as indications of, 651
Defoliation, chemical, of cotton, compositional and physiological changes associated with the, 754
Deformation and Flow in Biological Systems, A. Frey-Wyssling, Editor, 843
Derscheid, Lyle A., Physiological and morphological responses of barley to 2,4-dichlorophenoxyacetic acid, 121
Deuel, Harry J., Jr., The Lipids, Volume I: Chemistry, 430
Development of chloroplast activity during greening of etiolated barley leaves, the Hill reaction, 212
of injury, the relation of acids and peroxides in spray oils to the respiration of sprayed bean leaves and the, 507
Disaccharides, monosaccharides, and trisaccharides, II. the chromatographic separation of the, from plant extracts. The biosynthesis of carbon-14-labeled compounds, 422
Die Wuchsstofflehre. Ergebnisse und Probleme der Wuchstofforschung, by H. Söding, 843
Dillewijn, C. van, Botany of Sugarcane, 843
Diortho substituted phenoxyacetic acids as antiauxins, 834
Distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione, the, 675
Dufrenoy, Jean, Growth regulating properties of some thiosemicarbazones, 622
Dugger, W. M., The permeability of nonstomate leaf epidermis to carbon dioxide, 489
Duisberg, Peter C., Some relationships between xerophytism and the content of resin, nordihydroguaiaretic acid and protein of *Larrea divaricata* Cav., 769
Dungan, G. H., Some effects of artificial drying of corn grain, 794

E

Earle, F. R., Some effects of artificial drying of corn grain, 794
Earley, E. B., Percentage of carbohydrates in kernels of Station Reid Yellow Dent corn at several stages of development, 184
Eaton, Frank M., Fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and fruitfulness, 541
Effect of age of leaves upon the rate of photosynthesis in some conifers, 685
of calcium on the absorption of potassium by barley roots, the, 583
of different tissue pretreatments on the physico-chemical properties of expressed plant sap, the, 818
of hypocotyl temperature on translocation of carbohydrates from bean leaves, the, 417
of intermittently varied petiole temperature on carbohydrate translocation from bean leaves, the, 631
of light and nitrogen levels of growth and alkaloid content of young plants of *Cinchona ledgeriana*, the, 575
of petroleum oil spray on photosynthesis and respiration in citrus leaves, 269
of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes, the, 135
of 2,4-dichlorophenoxyacetic acid on meristematic tissues of corn, 803
of 2,4-dichlorophenoxyacetic acid on proteolytic activity of red kidney bean plants, 639
Effects, cobalt and light, on expansion of etiolated bean leaf disks, relationship of the, 408
of iron, the uptake of phosphorus by bean plants with particular reference to the, 431
of light on elongation and branching on pea roots, 591
Electrical and curvature responses of the Avena coleoptile to unilateral illumination, 251
conductivity method for accurately following changes in the respiratory quotient of a single biological sample, an improved, 70
Elliott, B. B., A relationship between photoperiodism and respiration, 787
Elongation and branching on pea roots, effects of light on, 591
Embryos, corn, the mechanism of the tetrazolium reaction in, 445
Enzymatic activities as indications of copper and iron deficiencies in plants, 651

Enzyme systems, triphosphopyridine nucleotide-linked, the distribution in higher plants of, capable of reducing glutathione, 675

Epidermis, non-stomate leaf, the permeability of, to carbon dioxide, 489

EPSTEIN, EMANUEL, A kinetic study of the absorption of alkali cations by barley roots, 457

ERGLE, DAVID R., Fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and fruitfulness, 541

Etiolated bean leaf disks, relationship of the cobalt and light effects on expansion of, 408

Extracellular photosynthetic reactions. II. Identification of radioactive malate, 828

Extracts, plant, II. the chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from, The biosynthesis of carbon-14-labeled compounds, 422

EZELL, BOYCE D., Influence of storage temperature on carotene, total carotenoids and ascorbic acid content of sweet-potatoes, 81

Pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of sweet potatoes, 355

F

Factors, some, affecting nectar secretion in red clover, 95

Fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and fruitfulness, 541

FIELDS, MELVIN, Metabolism of 2,4-dichlorophenoxyacetic acid, I. $C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids, 293

Fig cuttings as influenced by the application of indolebutyric acid, varietal root and top regeneration of, 309

Flowering of transplanted tobacco, effects of vernalization, seedling age and environment on subsequent growth and, Premature blossoming:, 745

Formation of starch in leaves of *Bryophyllum calycinum* cultured in darkness, the, 231

4-Chlorophenoxyacetic acid, berry thinning, and girdling, increasing the size of Thompson seedless grapes by means of, 626

FREELAND, R. O., Effect of age of leaves upon the rate of photosynthesis in some conifers, 685

Freezing injury in maturing maize, physiological changes and, 778

FRENCH, C. S., The Hill reaction: Development of chloroplast activity during greening of etiolated barley leaves, 212

Frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers and isoleucine and leucine and with *Bacillus cereus* toxin, 302

FREY-WYSSLING, A., Deformation and Flow in Biological Systems, 843

Frit, iron-containing, as a nutriculture medium, 204

Fruitfulness, fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by moisture supply and, 541

Fungi as a straight line transformation, temperature responses of, 634

Further studies in the simplification of equipment for subirrigation experiments in plant nutrition, 405

G

GALLUP, AVERY H., Absorption and translocation of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by green plants, 603

GALSTON, ARTHUR W., Principles of Plant Physiology, 430

Gas exchange, metabolic, measurement of, with a recording mass spectrometer, 320

GAUSMAN, H. W., Some effects of artificial drying of corn grain, 794

Genetic and chlorophyll studies of a yellow-green mutant in muskmelon, 263

Girdling, increasing the size of Thompson seedless grapes by means of 4-chlorophenoxyacetic acid, berry thinning and, 626

Glutathione, the distribution of higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing, 675

GODDARD, DAVID R., An improved electrical conductivity method for accurately following changes in the respiratory quotient of a single biological sample, 70

GORTON, B. S., Ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, 191

Gossypium L., some effects of zinc on several species of, 812

Gradients, longitudinal, of P^{32} absorption in roots, 661

Grape, nitrogen and amino acids in normal, habituated, and bacteria-free crown gall tumor tissue cultures of, 173

Grapes, Thompson seedless, increasing the size of, by means of 4-chlorophenoxyacetic acid, berry thinning and girdling, 626

Growth and alkaloid content of young plants of *Cinchona ledgeriana*, the effect of light and nitrogen levels on, 575

inhibition of, by benzene hexachloride isomers and protective effect of glucose as measured by cell counting technique, 526

in the Avena coleoptile, relationships of certain nutrients, metabolites, and inhibitors to, 49

regulating properties of some thiosemicarbazones, 622

-regulators, plant, surface activity as related to physiological activity of, 285

seedling, stimulation of, by seed treatments with N-phenyl succinimide derivatives, 179

subsequent, and flowering of transplanted tobacco, effects of vernalization, seedling age and environment on, Premature blossoming:, 745

GUSTAFSON, FELIX G., Absorption and translocation of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by green plants, 603

H

HAAGEN-SMIT, A. J., Investigation on injury to plants from air pollution in the Los Angeles area, 18

HACKETT, DAVID P., The osmotic change during auxin-induced water uptake by potato tissue, 279

HAGEN, C. E., A kinetic study of the absorption of alkali cations by barley roots, 457

HALL, H. H., Some effects of artificial drying of corn grain, 794

HALL, WAYNE C., Compositional and physiological changes associated with the chemical defoliation of cotton, 754

HAMNER, CHARLES L., Effect of 2,4-dichlorophenoxyacetic acid on proteolytic activity on red kidney bean plants, 639

HANDLEY, RAYMOND, The effect of calcium on the absorption of potassium by barley roots, 583

HEIMBÜRGER, GUNILLA, Extracellular photosynthetic reactions. II. Identification of radio-active malate, 828

HENDRICKS, S. B., Enzymatic activities as indications of copper and iron deficiencies in plants, 651

Hill reaction: Development of chloroplast activity during greening of etiolated barley leaves, the, 212

HOPKINS, H. T., Inhibition of growth by benzene hexachloride isomers and protective effect of glucose as measured by cell counting technique, 526

HOSKINS, W. M., The relation of acids and peroxides in spray oils to the respiration of sprayed bean leaves and the development of injury, 507

HULL, HERBERT, Investigation on injury to plants from air pollution in the Los Angeles area, 18

Hypocotyl temperature on translocation of carbohydrates from bean leaves, the effect of, 417

I

Illumination, unilateral, electrical and curvature responses of the Avena coleoptile to, 251

Improved electrical conductivity method for accurately following changes in the respiratory quotient of a single biological sample, an, 70

Increasing the size of Thompson seedless grapes by means of 4-chlorophenoxy-

acetic acid, berry thinning and girdling, 626
Indolebutyric acid, varietal root and top regeneration of fig cuttings as influenced by the application of, 309
Industrial Oil and Fat Products, by ALTON E. BAILEY, 429
Influence of storage temperature on carotene, total carotenoids and ascorbic acid content of sweetpotatoes, 81
of the green mesophyll in stomatal movement, the, 206
Inhibition of growth by benzene hexachloride isomers and protective effect of glucose as measured by cell counting technique, 526
sprout, and storage quality of potatoes, the effect of preharvest foliar sprays of maleic hydrazide on, 135
Inhibitor of maize root respirations, malonic acid as an, 725
Inhibitors to growth in the Avena coleoptile, relationships of certain nutrients, metabolites, and, 49
Investigation on injury to plants from air pollution in the Los Angeles area, 18
Ion Exchange Resins, by R. KUNIN and R. J. MYERS, 218
Ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, 191
Iron-containing frit as a nutriculture medium, 204
the uptake of phosphorus by bean plants with particular reference to the effects of, 431
Isocitric acid in excised leaves of *Bryophyllum calycinum* during culture in alternating light and darkness, the behavior of, 9
Isoleucine and leucine, frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of, and with *Bacillus cereus* toxin, 302
Isomers, benzene hexachloride, inhibition of growth by, and protective effect of glucose as measured by cell counting technique, 526
optical, of isoleucine and leucine, frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with, and with *Bacillus cereus* toxin, 302

J

JACOBS, MORRIS B., Editor, The Chemistry and Technology of Food and Food Products, Volumes I and II, 219
The Chemistry and Technology of Food and Food Products, Volume III, 649
JACOBSON, LOUIS, The effects of calcium on the absorption of potassium by barley roots, 583
JOHNSON, C. M., Molybdenum requirement of leguminous plants supplied with fixed nitrogen, 223
The relation of acids and peroxides in spray oils to the respiration of sprayed bean leaves and the development of injury, 507
JOHNSTONE, GEORGE R., Further studies in the simplification of equipment for subirrigation experiments in plant nutrition, 405

K

KENDALL, WILLIAM A., The effect of intermittently varied petiole temperature on carbohydrate translocation from bean leaves, 631
KERTESZ, Z. I., The Pectic Substances, 842
Kinetic study of the absorption of alkali cations by barley roots, a, 457
KLEIN, RICHARD M., Nitrogen and phosphorus fractions, respiration, and structure of normal and crown gall tissues of tomato, 335
KLEIN, W. H., Iron-containing frit as a nutriculture medium, 204
KOSKI, VIOLET M., The Hill reaction: Development of chloroplast activity during greening of etiolated barley leaves, 212
KRAMER, PAUL J., Longitudinal gradients of P^{32} absorption in roots, 661
KROG, NORMAN, The use of chromotropic acid for the quantitative determination of 2,4-dichlorophenoxyacetic acid, 822
KUNIN, R., Ion Exchange Resins, 218

L

LANE, HARRY C., Compositional and physiological changes associated with the chemical defoliation of cotton, 754
Larrea divaricata Cav., some relationships between xerophytism and the content

of resin, nordihydroguaiaretic acid and protein of, 769
LAURITZEN, JOHN I., Obituary, 427
Leaf disks, etiolated bean, relationship of the cobalt and light effects on expansion of, 408
epidermis, non-stomate, the permeability of, to carbon dioxide, 489
Leaves, absorption spectra of, I. The visible spectrum, 370
bean, the effect of intermittently varied petiole temperature on carbohydrate translocation from, 631
citrus, effect of petroleum oil spray on photosynthesis and respiration in, 269
effect of age of, upon the rate of photosynthesis in some conifers, 685
excised, of *Bryophyllum calycinum* during culture in alternating light and darkness, the behavior of isocitric acid in, 9
of *Bryophyllum calycinum* cultured in darkness, the formation of starch in, 231
sprayed bean, the relation of acids and peroxides in spray oils to the respiration of, and the development of injury, 507
tobacco, metabolism of infiltrated organic acids by, 240
LEE, ADDISON E., Nitrogen and amino acids in normal, habituated, and bacteria-free crown gall tumor tissue cultures of grape, 173
LEOPOLD, A. C., A relationship between photoperiodism and respiration, 787
Lespedeza, photoperiodic response of, 644
LETOURNEAU, DUANE, The use of chromotropic acid for the quantitative determination of 2,4-dichlorophenoxyacetic acid, 822
Leucine, frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of isoleucine and, and with *Bacillus cereus* toxin, 302
Light absorption by chlorophyll at high concentrations, 413
and nitrogen levels on growth and alkaloid content of young plants of *Cinchona ledgeriana*, the effect of, 575
effects on expansion of etiolated bean leaf disks, relationship of the cobalt and, 408
on elongation and branching on pea roots, effects of, 591
LINCK, A. J., The effect of hypocotyl temperature on translocation of carbohydrates from bean leaves, 417
Lipids, The, Volume I: Chemistry, by HARRY J. DEUEL, JR., 430
LILLY, V. G., Physiology of the Fungi, 217
Longitudinal gradients of P^{32} absorption in roots, 661
LOOMIS, W. E., Absorption spectra of leaves. I. The visible spectrum, 370
LOUSTALOT, ARNAUD J., The effect of light and nitrogen levels on growth and alkaloid content of young plants of *Cinchona ledgeriana*, 575
LUCAS, E. H., Studies in plant carbonic anhydrase. II. Kinetic studies, 111
LUSANANDANA, BHAKDI, A comparative study of gradual and abrupt changes in root temperature on water absorption, 475

M

MACK, WARREN B., Obituary, 839
MACMASTERS, M. M., Some effects of artificial drying of corn grain, 794
Maize, maturing, physiological changes and freezing injury in, 778
root respiration, malonic acid as an inhibitor of, 725
Malate, radioactive, II. identification of, Extracellular photosynthetic reactions, 828
Maleic hydrazide, the effect of preharvest foliar sprays of, on sprout inhibition and storage quality of potatoes, 135
MALLAH, TARA S., Varietal root and top regeneration of fig cuttings as influenced by the application of indolebutyric acid, 309
Malonic acid as an inhibitor of maize root respiration, 725
Manual of Phycology, G. M. SMITH, Editor, 218
Mass spectrometer, recording, measurement of metabolic gas exchange with a, 320
MCCALL, DR. MAX A., Retirement of, 214
MCRAE, D. HAROLD, Diortho substituted phenoxyacetic acids as antiauxins, 834
MEAGHER, W. R., Molybdenum requirement of leguminous plants supplied with fixed nitrogen, 223

Measurement of metabolic gas exchange with a recording mass spectrometer, 320
of oxidation-reduction potentials of cottonseed slurries, the, 500
Mechanism of the tetrazolium reactions in corn embryos, the, 445
Meristematic tissues of corn, effect of 2,4-dichlorophenoxyacetic acid on, 803
Mesophyll, green, the influence of the, in stomatal movement, 206
Metabolism of infiltrated organic acids by tobacco leaves, 240
of 2,4-dichlorophenoxyacetic acid. I. $C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids, 293
Metabolites, relationships of certain nutrients, and inhibitors to growth in the Avena coleoptile, 49
Method, an improved electrical conductivity, for accurately following changes in the respiratory quotient of a single biological sample, 70
MEYER, KURT H., Natural and Synthetic High Polymers, 428
MILLER, CARLOS O., Relationship of the cobalt and light effects on expansion of etiolated bean leaf disks, 408
MINARIK, C. E., Albinism induced by substituted benzoic acids, 210
Mineral Nutrition of Plants, EMIL TRUOG, Editor, 427
Modern Trends in Physiology and Biochemistry, E. S. G. BARRON, Editor, 648
Moisture supply and fruitfulness, fiber properties and carbohydrate and nitrogen levels of cotton plants as influenced by, 541
Molybdenum requirement of leguminous plants supplied with fixed nitrogen, 223
Monosaccharides, disaccharides, and trisaccharides, II. the chromatographic separation of the, from plant extracts. The biosynthesis of carbon-14-labeled compounds, 422
Moss, R. A., Absorption spectra of leaves. I. The visible spectrum, 370
Movement, stomatal, the influence of the green mesophyll in, 206
MUIR, ROBERT M., Surface activity as related to physiological activity of plant growth-regulators, 285
MÜLLER, OTTO H., The Polarographic Method of Analysis, 218
Muskmelon, genetic and chlorophyll studies of a yellow-green mutant in, 263
MYERS, R. J., Ion Exchange Resins, 218

N

NAKATA, SHIGERU, Photoperiodic response of Lespedeza, 644
Natural and Synthetic High Polymers, by KURT H. MEYER, 428
Nectar secretion in red clover, some factors affecting, 95
New England Section, A.S.P.P. Annual Meeting, 1952, 839
Nicotiana tabacum, frenching symptoms produced in, and *Nicotiana rustica* with optical isomers of isoleucine and leucine and with *Bacillus cereus* toxin, 302
NIER, O. C., Measurement of metabolic gas exchange with a recording mass spectrometer, 320
N^{15}, the amino acid composition and distribution of, in soybean root nodules supplied N^{15}-enriched N_2, 1
Nitrogen and amino acids in normal, habituated, and bacteria-free crown gall tumor tissue cultures of grape, 173
and phosphorus fractions, respiration and structure of normal and crown gall tissues of tomato, 335
fixed, molybdenum requirement of leguminous plants supplied with, 223
levels, fiber properties and carbohydrate and, of cotton plants as influenced by moisture supply and fruitfulness, 541
levels, the effect of light and, on growth and alkaloid content of young plants of *Cinchona ledgeriana*, 575
NOBLE, WILFRED, Investigation on injury to plants from air pollution in the Los Angeles area, 18
Nodules, soybean root, the amino acid composition and distribution of N^{15} in, supplied N^{15}-enriched N_2, 1
NOGGLE, G. R., The biosynthesis of carbon-14-labeled compounds. II. The chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from plant extracts, 422
NORD, F. F., Editor, Advances in Enzymology and Related Subjects of Biochemistry, Volume XII, 429

Advances in Enzymology and Related Subjects of Biochemistry, Volume XIII, 841
Nordihydroguaiaretic acid, resin, and protein of *Larrea divaricata* Cav., some relationships between xerophytism and the content of, 769
NORMAN, A. G., Editor, Advances in Agronomy, Volume III, 429
N-phenyl succinimide derivatives, stimulation of seedling growth by seed treatments with, 179
Nutriculture medium, iron-containing frit as a, 204
Nutrients, certain relationships of, metabolites, and inhibitors to growth in the Avena coleoptile, 49
Nutrition, plant, further studies in the simplification of equipment for subirrigation experiments in, 405

O

OLSON, E. O., Ionic accumulation in citrus as influenced by rootstock and scion and concentration of salts and boron in the substrate, 191
Organic acids, infiltrated, metabolism of, by tobacco leaves, 240
Ortho-substitution in the synthetic auxins, the role of, 392
Osmotic change during auxin-induced water uptake by potato tissue, the, 279
OVERSTREET, ROY, The effect of calcium on the absorption of potassium by barley roots, 583
OWINGS, J. F., JR., Albinism induced by substituted benzoic acids, 210
Oxidation-reduction potentials of cottonseed slurries, the measurement of, 500
Oxygen by isolated chloroplasts, the action spectrum for the photochemical evolution of, 35

P

PALEG, LESLIE G., Surface activity as related to physiological activity of plant growth-regulators, 285
PATERSON, D. R., The effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes, 135
Pea roots, effect of light on elongation and branching in, 591
Pectic Substances, The, by Z. I. KERTESZ, 842
Percentage of carbohydrates in kernels of Station Reid Yellow Dent corn at several stages of development, 184
Permeability of non-stomate leaf epidermis to carbon dioxide, the, 489
Peroxides, the relation of acids and, in spray oils to the respiration of sprayed bean leaves and the development of injury, 507
Petiole temperature, intermittently varied, the effect of, on carbohydrate translocation from bean leaves, 631
Petroleum oil spray, effect of, on photosynthesis and respiration in citrus leaves, 269
Phenoxyacetic acids, diortho substituted, as antiauxins, 834
P^{32} absorption in roots, longitudinal gradients of, 661
Phosphorus fraction, nitrogen and, respiration, and structure of normal and crown gall tissues of tomato, 335
the uptake of, by bean plants with particular reference to the effects of iron, 431
Photoperiodic response of Lespedeza, 644
Photoperiodism and respiration, a relationship between, 787
Photosynthesis and Related Processes, Volume II, Part 1, by EUGENE I. RABINOWITCH, 217
and respiration in citrus leaves, effect of petroleum oil spray on, 269
in some conifers, effect of age of leaves upon the rate of, 685
Physiological and morphological responses of barley to 2,4-dichlorophenoxyacetic acid, 121
changes and freezing injury in maturing maize, 778
Physiology of the Fungi, by V. G. LILLY and H. L. BARNETT, 217
Plant extracts, II. the chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from, The biosynthesis of carbon-14-labeled compounds, 422
growth-regulators, surface activity as related to physiological activity of, 285
nutrition, further studies in the simplification of equipment for subirrigation experiments in, 405

Plants, bean, I. $C^{14}O_2$ production by, treated with labeled 2,4-dichlorophenoxyacetic acids. Metabolism of 2,4-dichlorophenoxyacetic acid, 293
bean, the uptake of phosphorus by, with particular reference to the effects of iron, 431
cotton, fiber properties and carbohydrate and nitrogen levels of, as influenced by moisture supply and fruitfulness, 541
green, absorption and translocation of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by, 603
young, of *Cinchona ledgeriana*, the effect of light and nitrogen levels on growth and alkaloid content of, 575
Polarographic Method of Analysis, The, by Otto H. Müller, 218
Potassium, the effect of calcium on the absorption of, by barley roots, 583
Potatoes, the effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of, 135
Potato and tomato leaves, temperature of, 710
tissue, the osmotic change during auxin-induced water uptake by, 279
tuber slices, ascorbic acid formation in, 736
Potentials, oxidation-reduction, of cottonseed slurries, the measurement of, 500
Pratt, Robertson, Growth regulating properties of some thiosemicarbazones, 622
Pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of sweetpotatoes, 355
Premature blossoming: Effects of vernalization, seedling age and environment on subsequent growth and flowering of transplanted tobacco, 745
Preparation of Manuscripts for Publication in Plant Physiology, 221
Principles of Plant Physiology, by James Bonner and Arthur W. Galston, 430
Protein of *Larrea divaricata* Cav., some relationships between xerophytism and the content of resin, nordihydroguaiaretic acid and, 769

Q

Quotient, respiratory, of a single biological sample, an improved electrical conductivity method for accurately following changes in the, 70

R

Rabinowitch, Eugene I., Photosynthesis and Related Processes, Volume II, Part 1, 217
Ramser, J. H., Some effects of artificial drying of corn grain, 794
Ready, D., Albinism induced by substituted benzoic acids, 210
Rebstock, Theodore L., Effect of 2,4-dichlorophenoxyacetic acid on proteolytic activity of red kidney bean plants, 639
Regeneration, top, of fig cuttings as influenced by the application of indolebutyric acid, varietal root and, 309
Relation of acids and peroxides in spray oils to the respiration of sprayed bean leaves and the development of injury, the, 507
Relationship between photoperiodism and respiration, a, 787
of the cobalt and light effects on expansion of etiolated bean leaf disks, 408
Relationships of certain nutrients, metabolites and inhibitors to growth in the Avena coleoptile, 49
Relative rates of photosynthetic assimilation of isotopic forms of carbon dioxide, the, 691
Resin, nordihydroguaiaretic acid and protein of *Larrea divaricata* Cav., some relationships between xerophytism and the content of, 769
Respiration, a relationship between photoperiodism and, 787
in citrus leaves, effect of petroleum oil spray on photosynthesis and, 269
maize root, malonic acid as an inhibitor of, 725
nitrogen and phosphorus fractions, and structure of normal and crown gall tissues of tomato, 335
of sprayed bean leaves, the relation of acids and peroxides in spray oils to the, and the development of injury, 507
Responses, brittleness and other, of corn to 2,4-dichlorophenoxyacetic acid, 153
electrical and curvature, of the Avena coleoptile to unilateral illumination, 251

physiological and morphological, of barley to 2,4-dichlorophenoxyacetic acid, 121
RHOADS, W. A., Effect of petroleum oil spray on photosynthesis and respiration in citrus leaves, 269
RIEHL, L. A., Effect of petroleum oil spray on photosynthesis and respiration in citrus leaves, 269
RODGERS, EARL G., Brittleness and other responses of corn to 2,4-dichlorophenoxyacetic acid by bean plants, 153
Role of ortho-substitution in the synthetic auxins, the, 392
Root nodules, soybean, supplied N^{15}-enriched N_2, the amino acid composition and distribution of N^{15} in, 1
respiration, maize, malonic acid as an inhibitor of, 725
temperature on water absorption, a comparative study of gradual and abrupt changes in, 475
varietal, and top regeneration of fig cuttings as influenced by the application of indolebutyric acid, 309
Roots, barley, a kinetic study of the absorption of alkali cations by, 457
barley, the effect of calcium on the absorption of potassium by, 583
longitudinal gradients of P^{32} absorption in, 661
pea, effects of light on elongation and branching on, 591
Rootstock and scion and concentration of salts and boron in the substrate, ionic accumulation in citrus as influenced by, 191
ROTHACHER, J. S., A critical study of the cobalt chloride method of measuring transpiration, 563

S

SAH, PETER P. T., Growth regulating properties of some thiosemicarbazones, 622
Sap, expressed plant, the effect of different tissue pretreatments on the physicochemical properties of, 818
SCHRANK, A. R., Electrical and curvature responses of the Avena coleoptile to unilateral illumination, 251
SCHUMACHER, M. ELEANOR, The biosynthesis of carbon-14-labeled compounds. II. The chromatographic separation of the monosaccharides, disaccharides, and trisaccharides from plant extracts, 422
Scion, ionic accumulation in citrus as influenced by rootstock and, and concentration of salts and boron in the substrate, 191
Secretion, nectar, in red clover, some factors affecting, 95
Seedling age, vernalization, and environment, effect of, on subsequent growth and flowering of transplanted tobacco. Premature blossoming:, 745
Seedlings, barley, catalase-chlorophyll relationship in, 613
Seed treatments with N-phenyl succinimide derivatives, stimulation of seedling growth by, 179
SELL, HAROLD M., Effect of 2,4-dichlorophenoxyacetic acid on proteolytic activity of red kidney bean plants, 639
The effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes, 135
SHAW, B. T., Soil Physical Conditions and Plant Growth, 842
SHAW, R. H., Temperature of potato and tomato leaves, 710
SHUEL, R. W., Some factors affecting nectar secretion in red clover, 95
SKOOG, FOLKE, Stimulation of seedling growth by seed treatments with N-phenyl succinimide derivatives, 179
SMITH, FREDERICK G., Ascorbic acid formation in potato tuber slices, 736
The mechanism of the tetrazolium reaction in corn embryos, 445
SMITH, G. M., Editor, Manual of Phycology, 218
SMITH, JAMES H. C., The Hill reaction: Development of chloroplast activity during greening of etiolated barley leaves, 212
SÖDING, H., Die Wuchsstofflehre. Ergebnisse und Probleme der Wuchstofforschung, 843
Soil Physical Conditions and Plant Growth, B. T. SHAW, Editor, 842
Some effects of artificial drying of corn grain, 794
effects of zinc on several species of Gossypium L., 812
factors affecting nectar secretion in red clover, 95
relationships between xerophytism and the content of resin, nordihydroguaia-

retic acid and protein of *Larrea divaricata* Cav., 769
Southern Section, 648
Soybean root nodules supplied N^{15}-enriched N_2, the amino acid composition and distribution of N^{15} in, 1
Spectra, absorption, of leaves, I. The visible spectrum, 370
Spectrometer, recording mass, measurement of metabolic gas exchange with a, 320
Spectrum, the action, for the photochemical evolution of oxygen by isolated chloroplasts, 35
Spray oils, the relation of acids and peroxides in, to the respiration of sprayed bean leaves and the development of injury, 507
petroleum oil, effect of, on photosynthesis and respiration in citrus leaves, 269
Sprays, preharvest foliar, of maleic hydrazide, the effect of, on sprout inhibition and storage quality of potatoes, 135
STAFFORD, HELEN A., The distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione, 675
STANIFORTH, DAVID W., Effect of 2,4-dichlorophenoxyacetic acid on meristematic tissues of corn, 803
Starch, the formation of, in leaves of *Bryophyllum calycinum* cultured in darkness, 231
STEINBERG, ROBERT A., Frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of isoleucine and leucine and with *Bacillus cereus* toxin, 302
Premature blossoming: Effects of vernalization, seedling age and environment on subsequent growth and flowering of transplanted tobacco, 745
Stimulation of seedling growth by seed treatments with N-phenyl succinimide derivatives, 179
Structure of normal and crown gall tissues of tomato, nitrogen and phosphorus fractions, respiration, and, 335
Studies in plant carbonic anhydrase. II. Kinetic studies, 111
Subirrigation experiments in plant nutrition, further studies in the simplification of equipment for, 405
Surface activity as related to physiological activity of plant growth-regulators, 285
SWANSON, C. A., The effect of hypocotyl temperature on translocation of carbohydrates from bean leaves, 417
Sweetpotatoes, influence of storage temperature on carotene, total carotenoids and ascorbic acid content of, 81
pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of, 355

T

Temperature, hypocotyl, the effect of, on translocation of carbohydrates from bean leaves, 417
intermittently varied petiole, the effect of, on carbohydrate translocation from bean leaves, 631
of potato and tomato leaves, 710
response of fungi as a straight line transformation, 634
root, on water absorption, a comparative study of gradual and abrupt changes in, 475
storage, total carotenoids and ascorbic acid content of sweetpotatoes, influence of, on carotene, 81
Tetrazolium reaction in corn embryos, the mechanism of the, 445
THIMANN, KENNETH V., The Action of Hormones in Plants and Invertebrates, 842
The role of ortho-substitution in the synthetic auxins, 392
Thiosemicarbazones, growth regulating properties of some, 622
THOMPSON, H. E., Albinism induced by substituted benzoic acids, 210
Tissue pretreatments, different, the effect of, on the physico-chemical properties of expressed plant sap, 818
Tissues, crown gall, of tomato, nitrogen and phosphorus fractions, respiration, and structure of normal and, 335
meristematic, effect of 2,4-dichlorophenoxyacetic acid on, of corn, 803
Tobacco leaves, metabolism of infiltrated organic acids by, 240
transplanted, effect of vernalization, seedling age and environment on subsequent growth and flowering of, Premature blossoming:, 745

Tomato leaves, temperature of potato and, 710
nitrogen and phosphorus fractions, respiration, and structure of normal and crown gall tissues of, 335
TORREY, JOHN G., Effects of light on elongation and branching in pea roots, 591
Toxin, *Bacillus cereus*, frenching symptoms produced in *Nicotiana tabacum* and *Nicotiana rustica* with optical isomers of isoleucine and leucine and with, 302
Trace Elements in Plant Physiology, 218
Translocation, absorption and, of radioactive 2,4-dichloro-5-iodo^{131}-phenoxyacetic acid by green plants, 603
carbohydrate, from bean leaves, the effect of intermittently varied petiole temperature on, 631
of carbohydrates, the effect of hypocotyl temperature on, from bean leaves, 417
of 2,4-dichlorophenoxyacetic acid by bean leaves, the absorption and, 143
Transpiration, a critical study of the cobalt chloride method of measuring, 563
Triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione, the distribution in higher plants of, 675
Trisaccharides, II. the chromatographic separation of the monosaccharides, disaccharides, and, from plant extracts. The biosynthesis of carbon-14-labeled compounds, 422
TRUOG, EMIL, Editor, Mineral Nutrition of Plants, 427
Tuber slices, potato, ascorbic acid formation in, 736
2,4-Dichloro-5-iodo^{131}-phenoxyacetic acid, radioactive, absorption and translocation of, by green plants, 603
2,4-Dichlorophenoxyacetic acid, brittleness and other responses of corn to, 153
acid, effect of, on meristematic tissues of corn, 803
acid, effect of, on proteolytic activity of red kidney bean plants, 639
acid, metabolism of, I. $C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids, 293
acid, physiological and morphological responses of barley to, 121
acid, the absorption and translocation of, by bean plants, 143
acid, the use of chromotropic acid for the quantitative determination of, 822

U

Uptake of phosphorus by bean plants with particular reference to the effects of iron, the, 431
Use of chromotropic acid for the quantitative determination of 2,4-dichlorophenoxyacetic acid, the, 822

V

VAN NORMAN, RICHARD W., Measurement of metabolic gas exchange with a recording mass spectrometer, 320
The relative rates of photosynthetic assimilation of isotopic forms of carbon dioxide, 691
Varietal root and top regeneration of fig cuttings as influenced by the application of indolebutyric acid, 309
VENNESLAND, BIRGIT, The distribution in higher plants of triphosphopyridine nucleotide-linked enzyme systems capable of reducing glutathione, 675
Vernalization, seedling age and environment on subsequent growth and flowering of transplanted tobacco, Premature blossoming:, 745
VICKERY, HUBERT BRADFORD, The behavior of isocitric acid in excised leaves of *Bryophyllum calycinum* during culture in alternating light and darkness, 9
The formation of starch in leaves of *Bryophyllum calycinum* cultured in darkness, 231
VOIGT, G. K., The effect of different tissue pretreatments on the physico-chemical properties of expressed plant sap, 818

W

WAGGONER, PAUL E., Temperature of potato and tomato leaves, 710
WARREN, G. F., Iron-containing frit as a nutriculture medium, 204
Water absorption, a comparative study of gradual and abrupt changes in root temperature on, 475
uptake, auxin-induced, the osmotic change during, by potato tissue, 279

WEAVER, ROBERT J., Increasing the size of Thompson seedless grapes by means of 4-chlorophenoxyacetic acid, berry thinning, and girdling, 626

WEDDING, R. T., Effect of petroleum oil spray on photosynthesis and respiration in citrus leaves, 269

WEINTRAUB, ROBERT L., Metabolism of 2,4-dichlorophenoxyacetic acid. I. $C^{14}O_2$ production by bean plants treated with labeled 2,4-dichlorophenoxyacetic acids, 293

WELLER, L. E., The effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes, 135

WERKMAN, C. H., Bacterial Physiology, 428

Western Section, A.S.P.P. Annual Meeting, 1952, 427

WHITAKER, THOMAS W., Genetic and chlorophyll studies of a yellow-green mutant in muskmelon, 263

WIEBE, HERMAN H., Longitudinal gradients of P^{32} absorption in roots, 661

WILCOX, MARGUERITE S., Influence of storage temperature on carotene, total carotenoids and ascorbic acid content of sweetpotatoes, 81

Pre- and post-harvest changes in carotene, total carotenoids and ascorbic acid content of sweetpotatoes, 355

WILLIAMS, WILLIAMS O., Obituary, 215

WILSON, CHARLES C., Some effects of zinc on several species of Gossypium L., 812

WILSON, P. W., Bacterial Physiology, 428

The amino acid composition and distribution on N^{15} in soybean root nodules supplied N^{15}-enriched N_2, 1

WINKLER, A. J., Increasing the size of Thompson seedless grapes by means of 4-chlorophenoxyacetic acid, berry thinning and girdling, 626

WINTERS, HAROLD F., The effect of light and nitrogen levels on growth and alkaloid content of young plants of *Cinchona ledgeriana*, 575

WITTWER, S. H., The effect of preharvest foliar sprays of maleic hydrazide on sprout inhibition and storage quality of potatoes, 135

WOLF, JAMES M., An improved electrical conductivity method for accurately following changes in the respiratory quotient of a single biological sample, 70

WOODBRIDGE, C. G., The uptake of phosphorus by bean plants with particular reference to the effects of iron, 431

X

Xerophytism and the content of resin, nordihydroguaiaretic acid and protein of *Larrea divaricata* Cav., some relationships between, 769

Y

YARWOOD, C. E., Temperature response of fungi as a straight line transformation, 634

Z

ZAITLIN, MILTON, Investigation on injury to plants from air pollution in the Los Angeles area, 18

ZBINOVSKY, V., Metabolism of infiltrated organic acids by tobacco leaves, 240

ZELITCH, I., The amino acid composition and distribution of N^{15} in soybean root nodules supplied N^{15}-enriched N_2, 1

Zinc on several species of Gossypium L., some effects of, 812